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Fatal Injury Trends in the Construction Industry

July 31, 2024

Webinar Host/Support: **Jessica Bunting, MPH**, r2p Director, CPWR

Moderator: **G. Scott Earnest, PhD, PE, CSP**, Associate Director for Construction, Office of Construction Safety and Health, NIOSH

Presenter: **Amber Trueblood, DrPH**, Data Center Director, CPWR

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Fatal Injury Trends in the Construction Industry

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Outline

DEMO OF NEW INTERACTIVE CHART BOOK PRE-RELEASE

FATAL INJURY TRENDS

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New Interactive Pages

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Chart Book

Women in Construction

Women are underrepresented in many infrastructure-related industries, including construction, manufacturing, and clean energy (Shaw, 2023). All of these industries have a high demand for workers to meet federally funded projects. This need highlights the need for a diverse workforce and understanding trends of growing workforce populations to have timely and accurate data that can guide safety and health interventions, as well as recruitment and retainment efforts.

The number of women in construction have been increasing over the last 40 years. There were 614,100 women workers in 1985 which doubled to 1.3 Million women in 2023. This interactive dashboard highlights data trends for women in construction, including temporal trends and information on women workers by industry, occupation, and characteristic. The **year** filter updates the charts and the **bold underlined** key findings.

Beneath the interactive dashboard, you will find more information on the data source, definitions, chart notes, a downloadable data file, and recommended citation. This interactive data dashboard corresponds to the Women in Construction Chart Book Chapter. Data will be updated annually as available. If you have questions or comments, please email datacenter@cpwr.com.

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Women in Construction

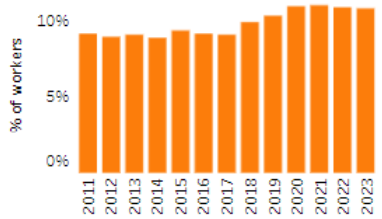
Year: (All)

Total women workers construction:	Total women craftworkers construction:
1.0 Million	226.0 Thousand

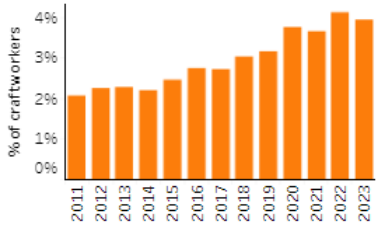
Women Construction Workers

- On average annually from 2011 to 2023, 9.9% of all construction workers were women.
- On average annually from 2011 to 2023, 3.0% of all construction craftworkers were women.
- All women in construction increased 57.1% and women craftworkers increased 139.9% from 2011 to 2023.

All Construction



Craftworkers



Women in Construction

Women are underrepresented in many infrastructure-related industries which have a high demand for additional workers to meet federally funded projects, such as workers in construction, manufacturing, and clean energy (Shaw, 2023). The Associated Builders and Contractors (ABC) estimates that the workforce shortage in construction is over half a million workers in 2024 (Associated Builders and Contractors, 2024). Highlighting the need for a diverse workforce and for understanding trends of growing workforce populations, including women, Hispanic, and workers 55 years or older (Harris et al., 2022).

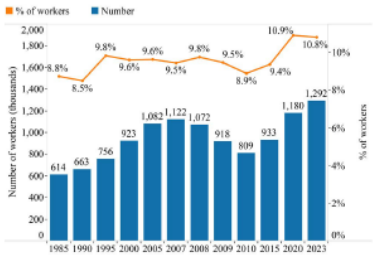
Looking at overall distribution of the workforce, women workers accounted for 10.8% of the workforce in 2023 which increased 2.4 percentage points since 1985 (8.4%; chart 1a). The number of women in construction have been increasing over the last 40 years. There were 614,100 women workers in 1985 which doubled to 1.3 Million women in 2023.

Looking at overall distribution of the workforce, women workers accounted for 10.8% of the workforce in 2023 which increased 2.4 percentage points since 1985 (8.4%; chart 1a). The number of women in construction have been increasing over the last 40 years. There were 614,100 women workers in 1985 which doubled to 1.3 Million women in 2023.

FINDINGS

Construction employment for all workers declined 23.5% during the Great Recession from 2007 to 2010 (11.9 Million to 9.1 Million) with additional smaller declines throughout 2012 (McAnaw Gallagher, 2022). Women in construction declined 27.9% during the same time period (1.1 Million to 808,600). By 2019, the number of women in construction surpassed pre-Great Recession numbers, reaching 1.2 Million. Women in construction were consistent from 2019 to 2020 with a 0.5% increase, but employment continued to grow 4.0% from 2021 to 2023.

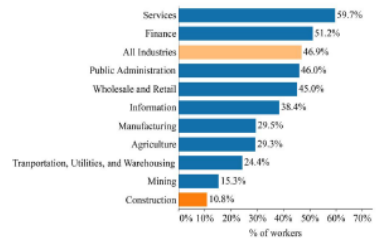
1a. Women workers in construction, selected years, 2000-2023



Source: IPUMS, 1985-2023 Current Population Survey.

Despite overall growth women continue to be underrepresented in construction, accounting for 10.8% of the construction workforce in 2023. In comparison, 46.9% off all workers across all industries were women (Chart 1b). Women working in services industries had the highest percentage of women workers at 59.7% in 2023. Women working in services industries had the highest percentage of women workers at 59.7% in 2023.

1b. Women as a percentage of all workers by industry, 2023



Source: IPUMS, 2023 Current Population Survey.

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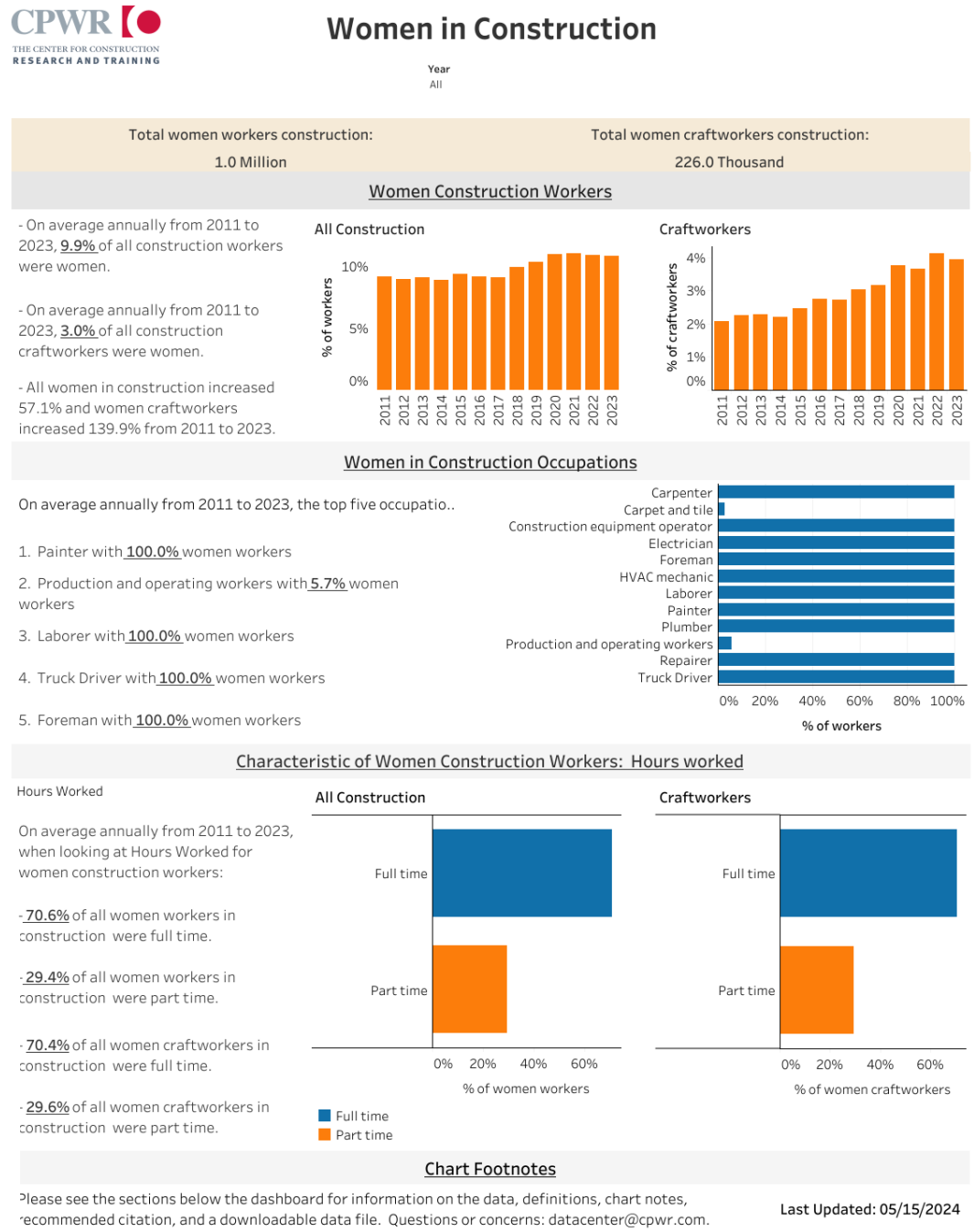
Interactive Chart Book

- Key findings change with filter selection
- Contents:
  - High Level Overview/Introduction
  - Dashboard
  - Technical Information
    - About the Data
    - Definitions and Chart Notes
    - Recommended Citation and Data File



About the Data

Definitions and Chart Notes

Recommended Citation and Data File

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Construction Establishments by Payroll Status

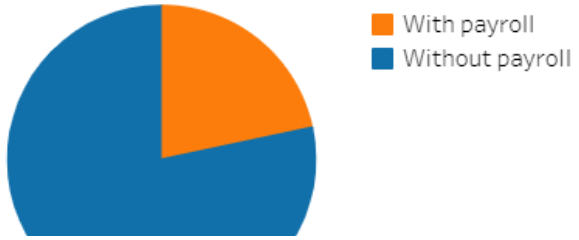
Year: (All) | Major subsector: (All)

Average Number of Establishments	Average Number of Establishments with Payroll	Average Number of Establishments without Payroll
3.3M	708.6K	2.6M

Establishments by payroll status: All Construction (NAICS 23)

From 2012 to 2022,

- 21.7% of establishments with payroll (n=708.6K)
- 78.3% of establishments without payroll (n=2.6M)



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Construction Establishments by Payroll Status

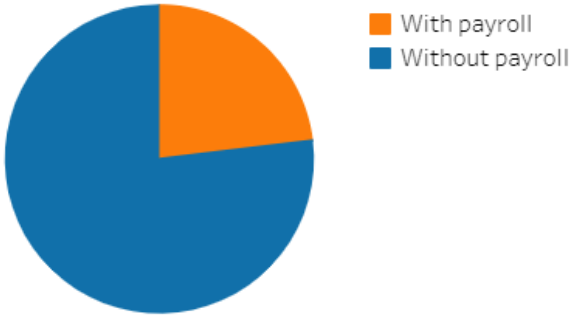
Year: (Multiple values) | Major subsector: Construction of ...

Average Number of Establishments	Average Number of Establishments with Payroll	Average Number of Establishments without Payroll
841.5K	194.3K	647.2K

Establishments by payroll status: Construction of Buildings (NAICS 236)

From 2012 to 2013,

- 23.1% of establishments with payroll (n=194.3K)
- 76.9% of establishments without payroll (n=647.2K)



Fatal Injury Trends

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Injury Data Sources

- United States
  - Fatal Injuries
    - BLS CFOI
    - CPWR Fatality Map
    - NVSS Mortality Data
  - Nonfatal Injuries
    - BLS SOII
    - OSHA Severe Injury Reports
- International
  - ILOSTAT

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International Fatal Injury Trends

Country	Rate per 100,000 FTE Workers
Turkey	31.4
Malta	26.3
Republic of Moldova	25.6
Russian Federation	17.0
Iceland	16.2
United States of America	16.0
Ukraine	15.1
Azerbaijan	14.0
Croatia	12.2

Source: ILOSTAT: https://rplumber.ilo.org/data/indicator/?id=INJ_FATL_ECO_RT_A&type=label&format=.csv

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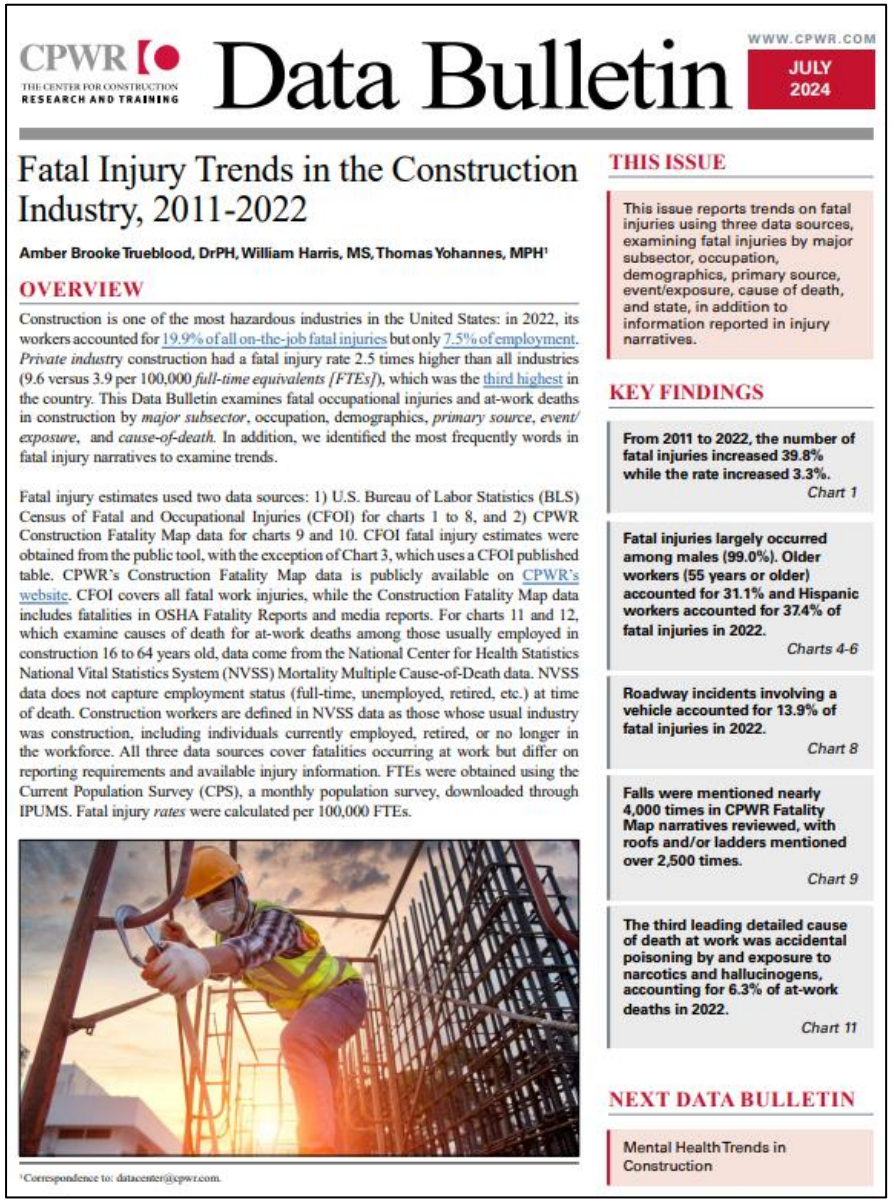
Fatal Injury Trends Data Bulletin

- Used three data sources
- Examined fatal injuries in construction by:
  - Major subsector
  - Occupation
  - Demographics
  - Primary source
  - Event/exposure
  - Cause of death
  - State
  - Injury narratives from CPWR's Fatality Map



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Data Bulletin

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JULY 2024

Fatal Injury Trends in the Construction Industry, 2011-2022

Amber Brooke Trueblood, DrPH, William Harris, MS, Thomas Yohannes, MPH[1]

OVERVIEW

Construction is one of the most hazardous industries in the United States: in 2022, its workers accounted for 19.9% of all on-the-job fatal injuries but only 7.5% of employment. *Private industry* construction had a fatal injury rate 2.5 times higher than all industries (9.6 versus 3.9 per 100,000 *full-time equivalents [FTEs]*), which was the third highest in the country. This Data Bulletin examines fatal occupational injuries and at-work deaths in construction by *major subsector*, occupation, demographics, *primary source*, *event/exposure*, and *cause-of-death*. In addition, we identified the most frequently words in fatal injury narratives to examine trends.

Fatal injury estimates used two data sources: 1) U.S. Bureau of Labor Statistics (BLS) Census of Fatal and Occupational Injuries (CFOI) for charts 1 to 8, and 2) CPWR Construction Fatality Map data for charts 9 and 10. CFOI fatal injury estimates were obtained from the public tool, with the exception of Chart 3, which uses a CFOI published table. CPWR's Construction Fatality Map data is publicly available on CPWR's website. CFOI covers all fatal work injuries, while the Construction Fatality Map data includes fatalities in OSHA Fatality Reports and media reports. For charts 11 and 12, which examine causes of death for at-work deaths among those usually employed in construction 16 to 64 years old, data come from the National Center for Health Statistics National Vital Statistics System (NVSS) Mortality Multiple Cause-of-Death data. NVSS data does not capture employment status (full-time, unemployed, retired, etc.) at time of death. Construction workers are defined in NVSS data as those whose usual industry was construction, including individuals currently employed, retired, or no longer in the workforce. All three data sources cover fatalities occurring at work but differ on reporting requirements and available injury information. FTEs were obtained using the Current Population Survey (CPS), a monthly population survey, downloaded through IPUMS. Fatal injury *rates* were calculated per 100,000 FTEs.

[1]Correspondence to: datacenter@cpwr.com.

THIS ISSUE

This issue reports trends on fatal injuries using three data sources, examining fatal injuries by major subsector, occupation, demographics, primary source, event/exposure, cause of death, and state, in addition to information reported in injury narratives.

KEY FINDINGS

From 2011 to 2022, the number of fatal injuries increased 39.8% while the rate increased 3.3%. *Chart 1*

Fatal injuries largely occurred among males (99.0%). Older workers (55 years or older) accounted for 31.1% and Hispanic workers accounted for 37.4% of fatal injuries in 2022. *Charts 4-6*

Roadway incidents involving a vehicle accounted for 13.9% of fatal injuries in 2022. *Chart 8*

Falls were mentioned nearly 4,000 times in CPWR Fatality Map narratives reviewed, with roofs and/or ladders mentioned over 2,500 times. *Chart 9*

The third leading detailed cause of death at work was accidental poisoning by and exposure to narcotics and hallucinogens, accounting for 6.3% of at-work deaths in 2022. *Chart 11*

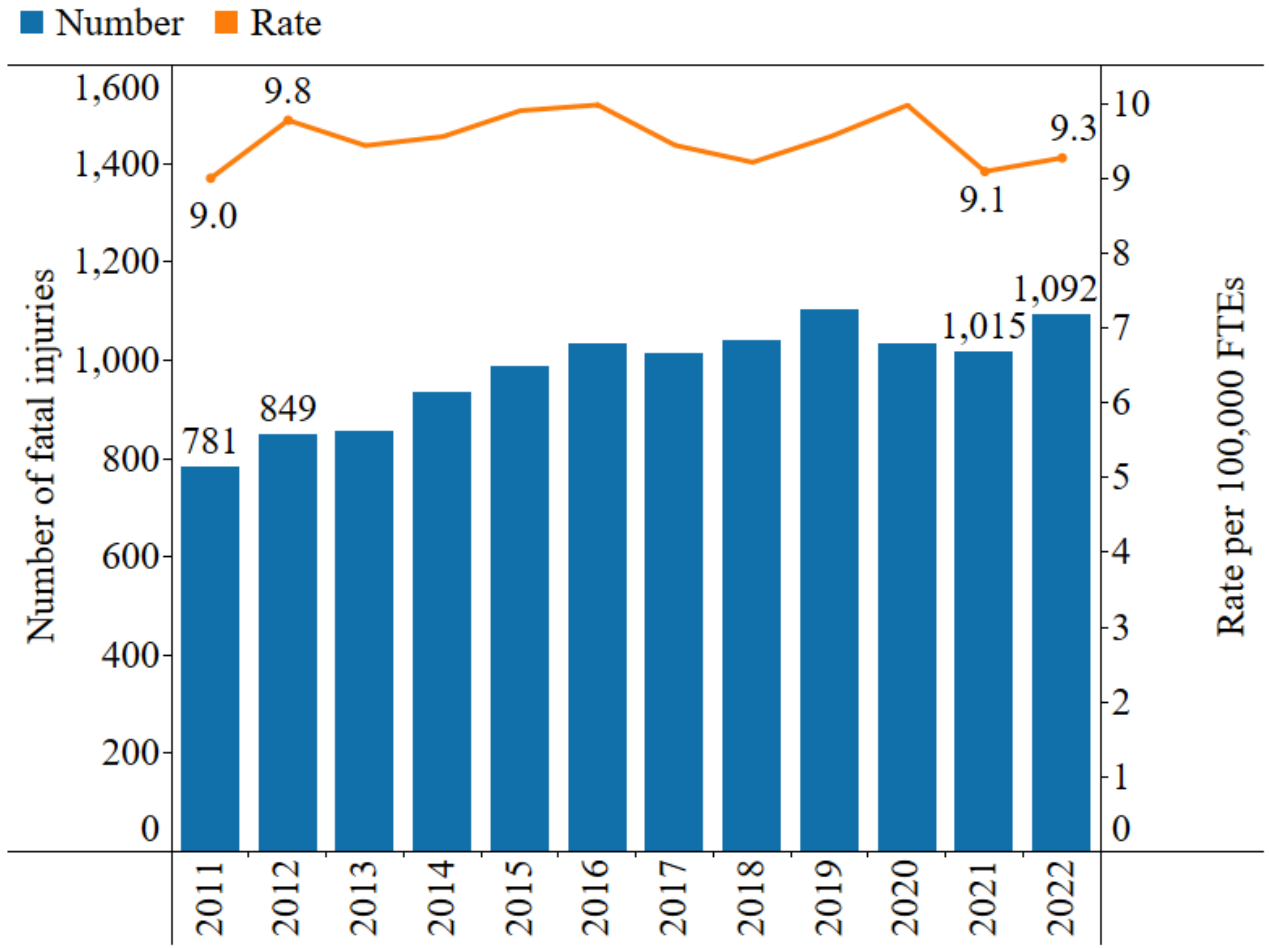
NEXT DATA BULLETIN

Mental Health Trends in Construction

https://www.cpwr.com/wp-content/uploads/DataBulletin-July2024.pdf

Fatal injuries by year

- From 2011 to 2022:
  - # of injuries ↑ **39.8%**
  - Rate of Injuries **3.3%**
- From 2021 to 2022:
  - # of injuries **↑ 7.6%**
  - Rate of Injuries **2.2%**



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Demographic Trends (2022)

- Sex
  - Males account for **99%** of fatal injuries with a rate **11x ↑** than that of females (**10.2** vs **0.9** per 100,000 FTE).
- Age
  - Workers 55 years or older had the highest rate (**13.6**) which was **1.6 x ↑** than those 35 to 54 years old (**8.5**) and **1.8 x ↑** than those 16 to 34 years old (**7.4**).
- Ethnicity
  - Hispanic construction workers fatal injury rate was **1.2 x ↑** than that of non-Hispanic workers (**10.2** vs **8.7**).

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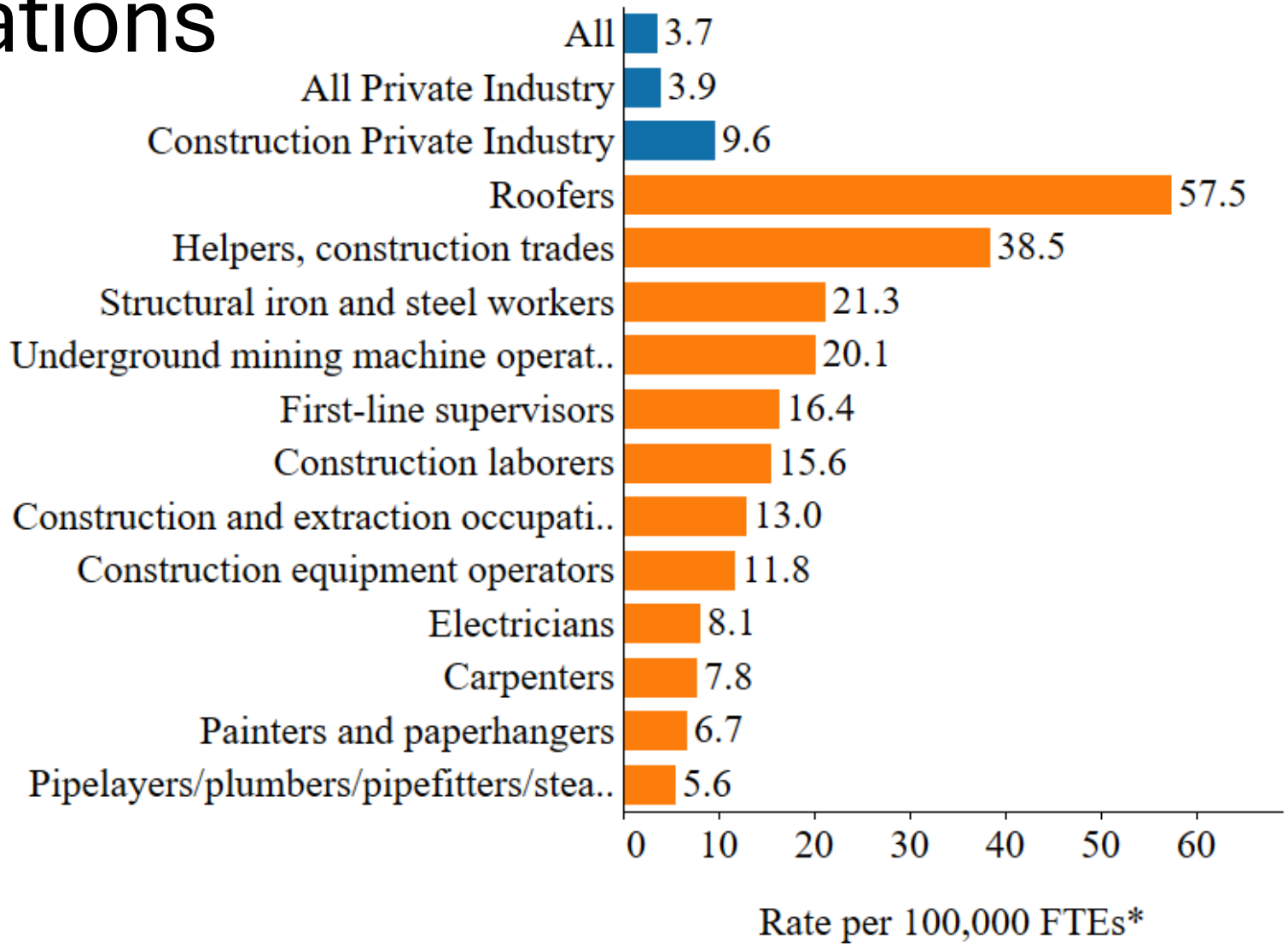
Fatal injuries in construction and extraction occupations



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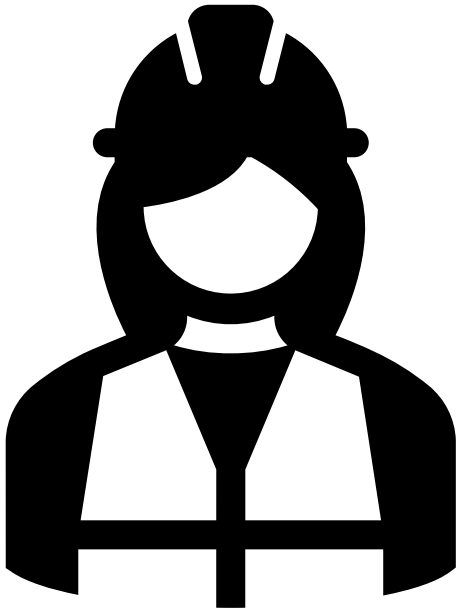
Focus Four Fatal Injuries



- Falls
  - Falls to lower level: **36.4%**
- Struck-by
  - Struck by object or equipment: **8.2%**
  - Pedestrian vehicular incident **6.2%**
- Electrocution
  - Exposure to electricity: **5.7%**
- Caught-in between
  - Struck, caught, or crushed in collapsing structure, equipment, or material: **4.9%**
  - Caught in or compressed by equipment or objects: **0.5%**

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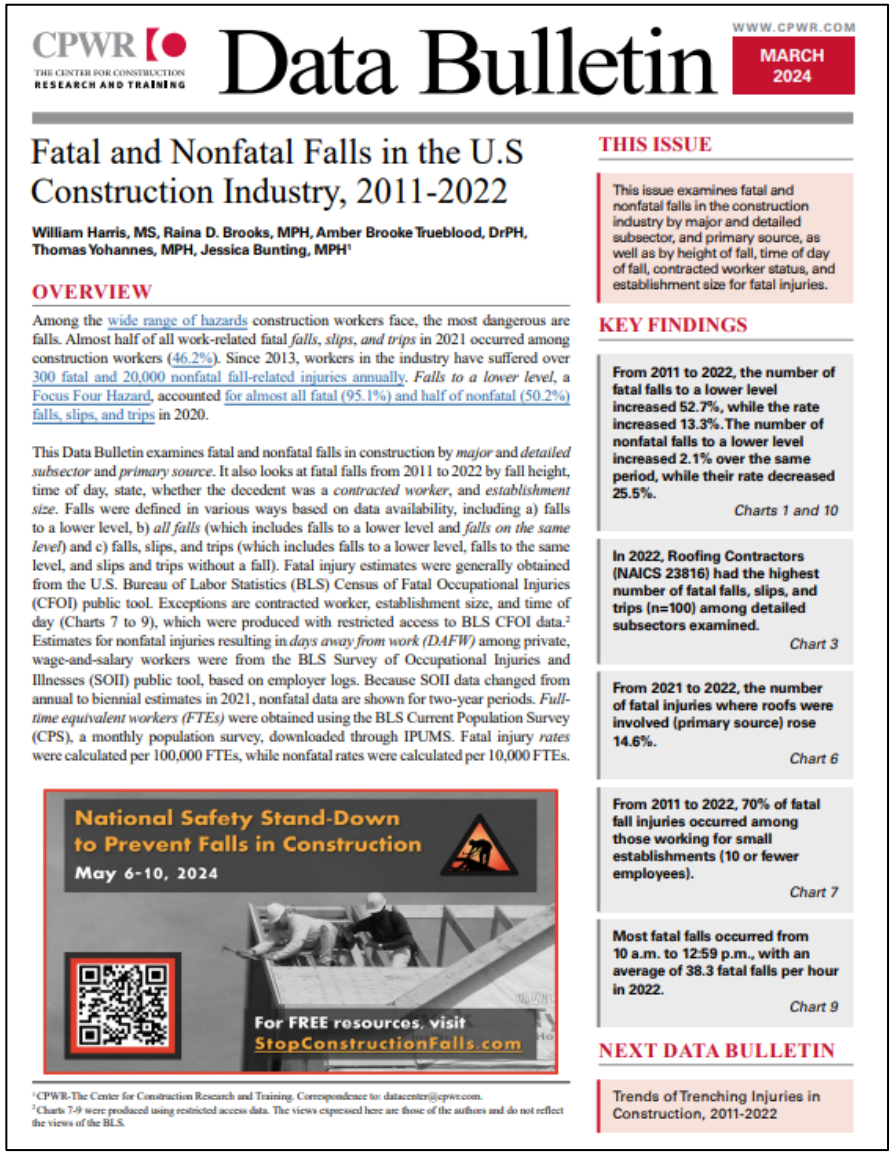
Falls Deep Dive

- From 2011 to 2022:
  - Falls to a lower level
    - Number **↑52.7%**
    - Rate **↑13.3%**
  - **70%** of fatal falls occurred among small establishments (10 or fewer employees)
  - Fall-Related Sources:
    - Roofs **↑14.6%**
    - Scaffolds and staging **↑4.1%**
    - Ladders **↓12.6%**



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MARCH 2024

Fatal and Nonfatal Falls in the U.S Construction Industry, 2011-2022

William Harris, MS, Raina D. Brooks, MPH, Amber Brooke Trueblood, DrPH, Thomas Yohannes, MPH, Jessica Bunting, MPH[1]

OVERVIEW

Among the wide range of hazards construction workers face, the most dangerous are falls. Almost half of all work-related fatal *falls*, *slips*, *and trips* in 2021 occurred among construction workers (46.2%). Since 2013, workers in the industry have suffered over 300 fatal and 20,000 nonfatal fall-related injuries annually. *Falls to a lower level*, a Focus Four Hazard, accounted for almost all fatal (95.1%) and half of nonfatal (50.2%) falls, slips, and trips in 2020.

This Data Bulletin examines fatal and nonfatal falls in construction by *major* and *detailed subsector* and *primary source*. It also looks at fatal falls from 2011 to 2022 by fall height, time of day, state, whether the decedent was a *contracted worker*, and *establishment size*. Falls were defined in various ways based on data availability, including a) falls to a lower level, b) *all falls* (which includes falls to a lower level and *falls on the same level*) and c) falls, slips, and trips (which includes falls to a lower level, falls to the same level, and slips and trips without a fall). Fatal injury estimates were generally obtained from the U.S. Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI) public tool. Exceptions are contracted worker, establishment size, and time of day (Charts 7 to 9), which were produced with restricted access to BLS CFOI data.[2] Estimates for nonfatal injuries resulting in *days away from work (DAFW)* among private, wage-and-salary workers were from the BLS Survey of Occupational Injuries and Illnesses (SOII) public tool, based on employer logs. Because SOII data changed from annual to biennial estimates in 2021, nonfatal data are shown for two-year periods. *Full-time equivalent workers (FTEs)* were obtained using the BLS Current Population Survey (CPS), a monthly population survey, downloaded through IPUMS. Fatal injury *rates* were calculated per 100,000 FTEs, while nonfatal rates were calculated per 10,000 FTEs.

[1] CPWR-The Center for Construction Research and Training. Correspondence to: datacenter@cpwr.com.
[2] Charts 7-9 were produced using restricted access data. The views expressed here are those of the authors and do not reflect the views of the BLS.

THIS ISSUE

This issue examines fatal and nonfatal falls in the construction industry by major and detailed subsector, and primary source, as well as by height of fall, time of day of fall, contracted worker status, and establishment size for fatal injuries.

KEY FINDINGS

From 2011 to 2022, the number of fatal falls to a lower level increased 52.7%, while the rate increased 13.3%.The number of nonfatal falls to a lower level increased 2.1% over the same period, while their rate decreased 25.5%.

Charts 1 and 10

In 2022, Roofing Contractors (NAICS 23816) had the highest number of fatal falls, slips, and trips (n=100) among detailed subsectors examined.

Chart 3

From 2021 to 2022, the number of fatal injuries where roofs were involved (primary source) rose 14.6%.

Chart 6

From 2011 to 2022, 70% of fatal fall injuries occurred among those working for small establishments (10 or fewer employees).

Chart 7

Most fatal falls occurred from 10 a.m. to 12:59 p.m., with an average of 38.3 fatal falls per hour in 2022.

Chart 9

NEXT DATA BULLETIN

Trends of Trenching Injuries in Construction, 2011-2022

https://www.cpwr.com/wp-content/uploads/DataBulletin-March2024.pdf

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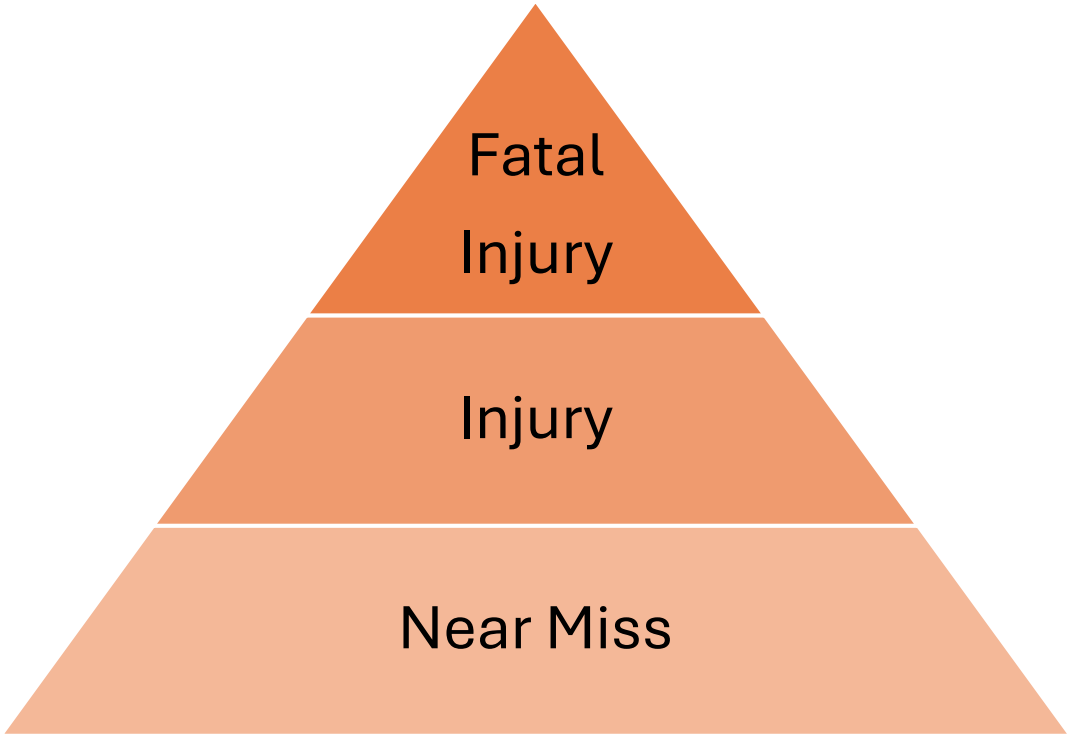
Other Injury Data Sources

- Nonfatal Injuries
  - Top 5 Event/Exposure 2021-2022

Event/Exposure	# of DAFW Cases	% of DAFW Cases
Struck by object or equipment	28,720	19.9%
Overexertion involving outside sources	22,220	15.4%
Falls to lower level	19,430	13.4%
Falls on same level	14,370	9.9%
Other exertions or bodily reactions	9,410	6.5%
Struck against object or equipment	9,130	6.3%



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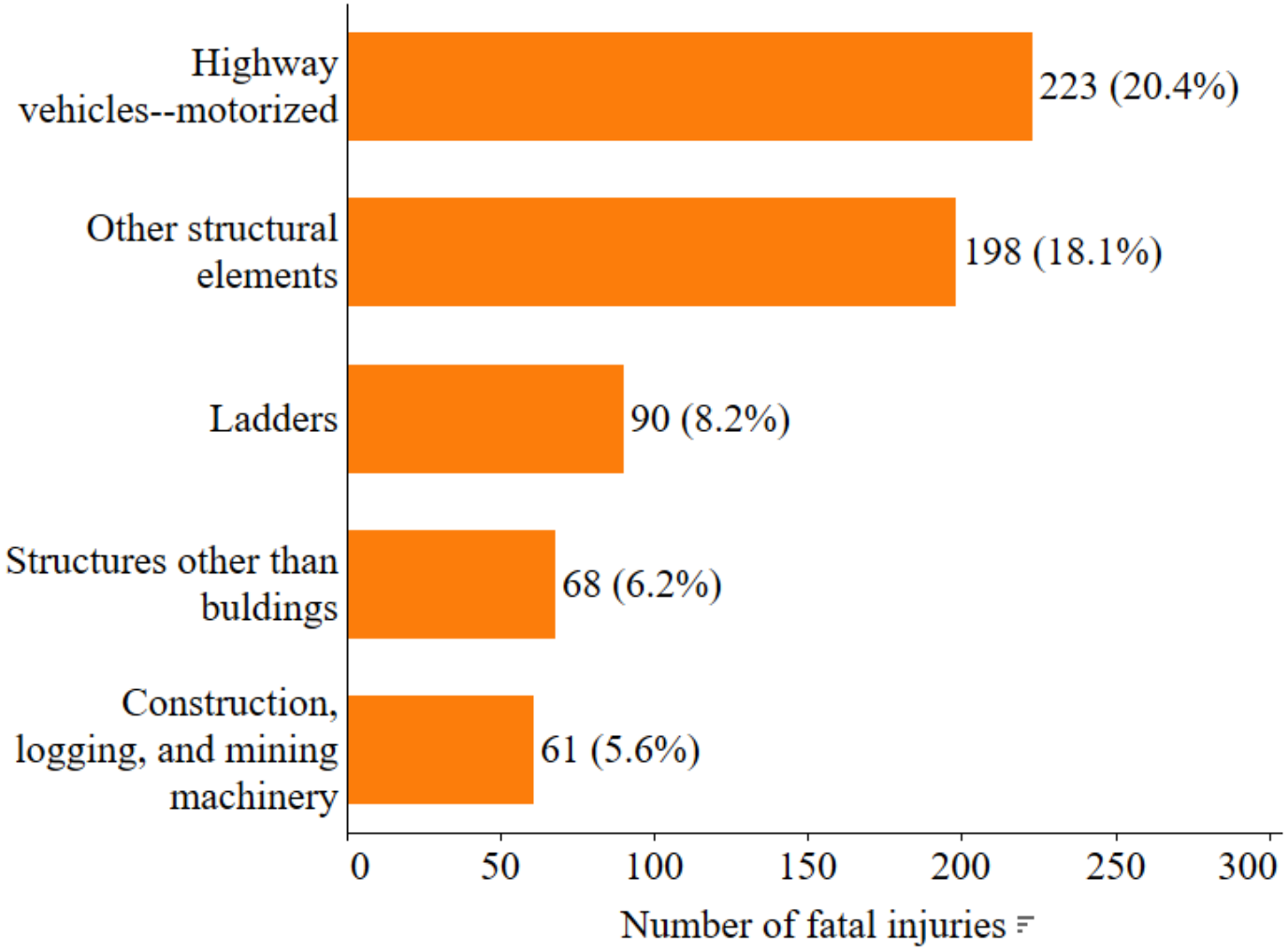
Primary Sources

- In 2022:
  - Highway vehicles-motorized: **20.4%**
  - Other structural elements:**18.1%**
  - Ladders: **8.2%**



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Words commonly found in fatality narratives

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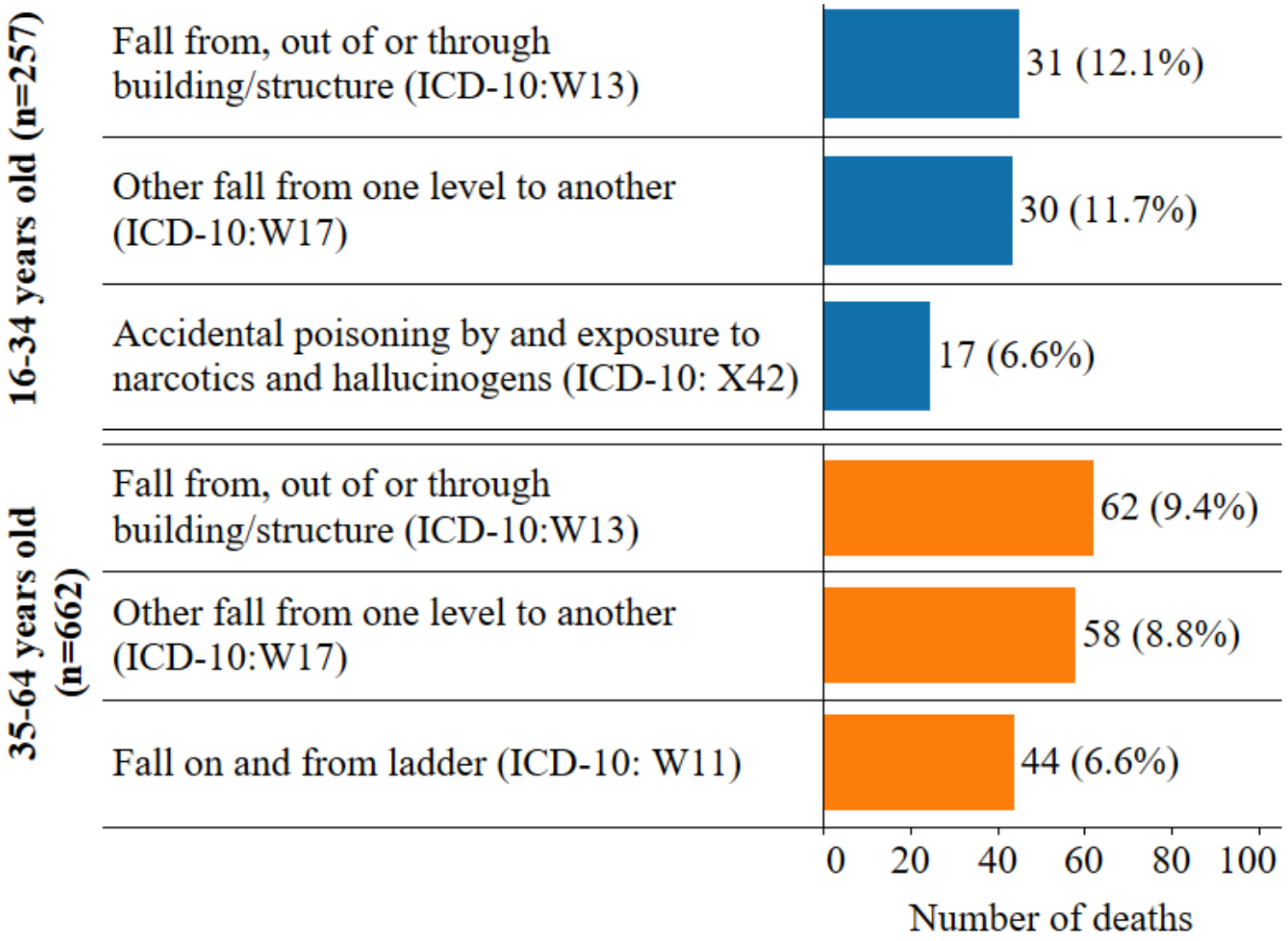
At-work Deaths



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So what?

Assess patterns → Identify and Monitor Risk factors → Guide prevention and intervention efforts and/or evaluate efforts

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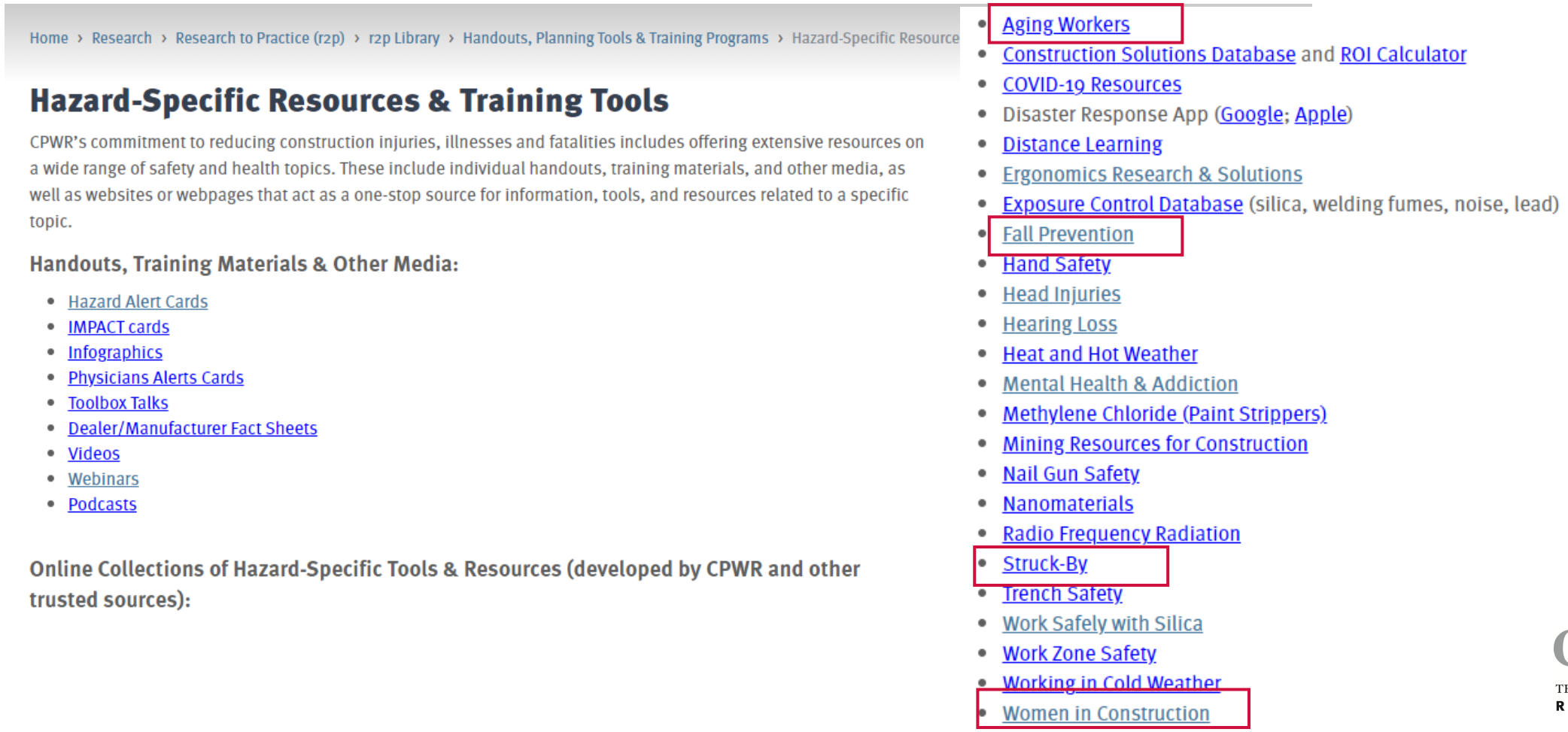
r2p Resources

HAZARD-SPECIFIC PAGE: https://www.cpwr.com/research/research-to-practice-r2p/r2p-library/other-resources-for-stakeholders/hazard-specific-resources/



Home › Research › Research to Practice (r2p) › r2p Library › Handouts, Planning Tools & Training Programs › Hazard-Specific Resource

Hazard-Specific Resources & Training Tools

CPWR's commitment to reducing construction injuries, illnesses and fatalities includes offering extensive resources on a wide range of safety and health topics. These include individual handouts, training materials, and other media, as well as websites or webpages that act as a one-stop source for information, tools, and resources related to a specific topic.

Handouts, Training Materials & Other Media:

- Hazard Alert Cards
- IMPACT cards
- Infographics
- Physicians Alerts Cards
- Toolbox Talks
- Dealer/Manufacturer Fact Sheets
- Videos
- Webinars
- Podcasts

Online Collections of Hazard-Specific Tools & Resources (developed by CPWR and other trusted sources):

- Aging Workers
- Construction Solutions Database and ROI Calculator
- COVID-19 Resources
- Disaster Response App (Google; Apple)
- Distance Learning
- Ergonomics Research & Solutions
- Exposure Control Database (silica, welding fumes, noise, lead)
- Fall Prevention
- Hand Safety
- Head Injuries
- Hearing Loss
- Heat and Hot Weather
- Mental Health & Addiction
- Methylene Chloride (Paint Strippers)
- Mining Resources for Construction
- Nail Gun Safety
- Nanomaterials
- Radio Frequency Radiation
- Struck-By
- Trench Safety
- Work Safely with Silica
- Work Zone Safety
- Working in Cold Weather
- Women in Construction

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r2p Resources

Spanish Resources: https://www.cpwr.com/spanish-language-resources/

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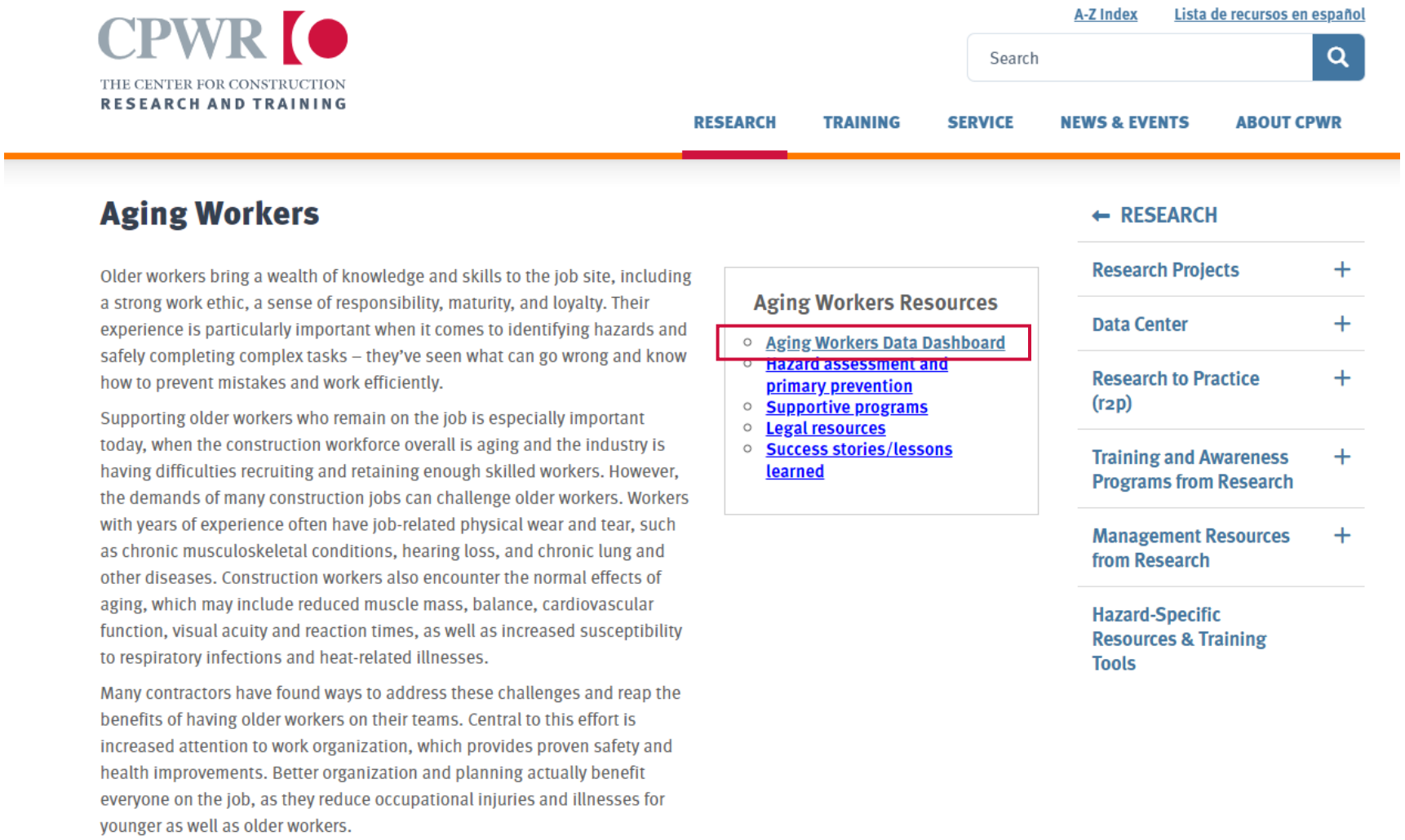
Aging Workers

https://www.cpwr.com/research/management-resources-from-research/aging-workers/



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Questions

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